

Mumbai University

Syllabus + Books

B.Sc.IT: SEMESTER – V

(SYLLABUS)

[2018 – 2019]

PAPER - II

**INTERNET OF
THINGS**

– : SYLLABUS : –

UNIT

I

THE INTERNET OF THINGS | DESIGN PRINCIPLES FOR CONNECTED DEVICES | INTERNET PRINCIPLES | HTTPS

- ⇒ The Internet of Things:
 - An Overview
 - The Flavour Of The Internet of Things
 - The "Internet" Of "Things"
 - The Technology Of The Internet Of Things
 - Enchanted Objects
 - Who Is Making The Internet Of Things?
- ⇒ Design Principles For Connected Devices:
 - Calm And Ambient Technology
 - Magic As Metaphor
 - Privacy
 - Keeping Secrets
 - Whose Data Is It Anyway?
 - Web Thinking For Connected Devices
 - Small Pieces
 - Loosely Joined
 - First-Class Citizens On The Internet
 - Graceful Degradation
 - Affordances
- ⇒ Internet Principles:
 - Internet Communications:
 - An Overview
 - IP
 - TCP
 - The IP Protocol Suite (TCP/IP)
 - UDP
 - IP Addresses
 - DNS
 - Static IP Address Assignment
 - Dynamic IP Address Assignment
 - IPv6
 - MAC Addresses
 - TCP and UDP Ports
- ⇒ An Example:
 - HTTP Ports
 - Other Common Ports
 - Application Layer Protocols
 - HTTP
- ⇒ HTTPS:
 - Encrypted HTTP
 - Other Application Layer Protocols

UNIT

II

THINKING ABOUT PROTOTYPING | PROTOTYPING EMBEDDED DEVICES

- ⇒ Thinking About Prototyping:
 - Sketching
 - Familiarity
 - Costs Versus Ease Of Prototyping
 - Prototypes And Production

Turn Over ➡

- Changing Embedded Platform
- Physical Prototypes And Mass Personalisation
- Climbing Into The Cloud
- Open Source Versus Closed Source
- Why Closed?
- Why Open?
- Mixing Open And Closed Source
- Closed Source For Mass Market Projects
- Tapping Into The Community

⇒ **Prototyping Embedded Devices:**

- Electronics
- Sensors
- Actuators
- Scaling Up The Electronics
- Embedded Computing Basics
- Microcontrollers
- System-On-Chips
- Choosing Your Platform
- Arduino
- Developing On The Arduino
- Some Notes On The Hardware
- Openness
- Raspberry Pi
- Cases And Extension Boards
- Developing On The Raspberry Pi
- Some Notes On The Hardware

UNIT

III

PROTOTYPING THE PHYSICAL DESIGN | PROTOTYPING ONLINE COMPONENTS

⇒ **Prototyping the Physical Design:**

- Preparation
- Sketch
- Iterate And Explore
- Nondigital Methods
- Laser Cutting
- Choosing A Laser Cutter
- Software
- Hinges And Joints
- 3D Printing
- Types Of 3D Printing
- Software
- CNC Milling
- Repurposing/Recycling

⇒ **Prototyping Online Components:**

- Getting Started With An API
- Mashing Up APIs
- Scraping
- Legalities
- Writing A New API
- Clockodillo
- Security
- Implementing The API
- Using Curl To Test
- Going Further

Turn Over ➡

- Real-Time Reactions
- Polling
- Comet
- Other Protocols
- MQ Telemetry Transport
- Extensible Messaging and Presence Protocol
- Constrained Application Protocol

UNIT IV

TECHNIQUES FOR WRITING EMBEDDED CODE | BUSINESS MODELS | PROVIDE INFRASTRUCTURE

⇒ Techniques For Writing Embedded Code:

- Memory Management
- Types Of Memory
- Making The Most Of Your RAM
- Performance And Battery Life
- Libraries
- Debugging

⇒ Business Models:

- A Short History Of Business Models
- Space And Time
- From Craft To Mass Production
- The Long Tail Of The Internet
- Learning From History
- The Business Model Canvas
- Who Is The Business Model For?
- Models
- Make Thing
- Sell Thing
- Subscriptions
- Customisation
- Be a Key Resource

⇒ Provide Infrastructure:

- Sensor Networks
- Take A Percentage
- Funding An Internet Of Things Startup
- Hobby Projects And Open Source
- Venture Capital
- Government Funding
- Crowdfunding
- Lean Startups

UNIT V

MOVING TO MANUFACTURE | ETHICS

⇒ Moving To Manufacture:

- What Are You Producing?
- Designing Kits
- Designing Printed circuit boards
- Software Choices
- The Design Process
- Manufacturing Printed Circuit Boards
- Etching Boards
- Milling Boards
- Assembly
- Testing

Turn Over ➡

- *Mass-Producing The Case And Other Fixtures*
- *Certification*
- *Costs*
- *Scaling Up Software*
- *Deployment*
- *Correctness And Maintainability*
- *Security*
- *Performance*
- *User Community*

⇒ **Ethics:**

- *Characterizing The Internet Of Things*
- *Privacy*
- *Control*
- *Disrupting Control*
- *Crowdsourcing*
- *Environment*
- *Physical Thing*
- *Electronics*
- *Internet Service*
- *Solutions*
- *The Internet Of Things As Part Of The Solution*

Turn Over ⇨

– : BOOKS : –

1. **BOOK TITLE:** ARTIFICIAL INTELLIGENCE & SOFT COMPUTING FOR BEGINNERS
AUTHOR'S: ANANDITA DAS BHATTACHARJEE
PUBLISHER: SHROFF
EDITION: 1ST
YEAR: 2014
PAPERBACK: 720 PAGES
DOWNLOAD/BUY: @[BLOGGER](#) | @[AMAZON](#) | @[FLIPKART](#)

2. **BOOK TITLE:** ARTIFICIAL INTELLIGENCE
AUTHOR'S: ELAINE RICH | KEVIN KNIGHT | SHIVASHANKAR NAIR
PUBLISHER: MCGRAW-HILL
EDITION: 3RD
YEAR: 01/JULY/2017
PAPERBACK: 588 PAGES
DOWNLOAD/BUY: @[BLOGGER](#) | @[PDF](#) | @[TORRENT](#)

3. **BOOK TITLE:** ARTIFICIAL INTELLIGENCE: A RATIONAL APPROACH
AUTHOR'S: RAHUL DEVA
PUBLISHER: SHROFF
EDITION: 1ST
YEAR: 2018
DOWNLOAD/BUY: @[BLOGGER](#) | @[AMAZON](#) | @[FLIPKART](#)

4. **BOOK TITLE:** A FIRST COURSE IN ARTIFICIAL INTELLIGENCE
AUTHOR'S: DEEPAK KHEMANI
PUBLISHER: MCGRAW-HILL
EDITION: 1ST
YEAR: 01/JULY/2017
PAPERBACK: 944 PAGES
DOWNLOAD/BUY: @[BLOGGER](#) | @[AMAZON](#) | @[PINTEREST](#)

5. **BOOK TITLE:** ARTIFICIAL INTELLIGENCE: A MODERN APPROACH
AUTHOR'S: STUART RUSSEL | PETER NORVIG
PUBLISHER: PEARSON
EDITION: 3RD
YEAR: 2015
PAPERBACK: 1164 PAGES
DOWNLOAD/BUY: @[BLOGGER](#) | @[PDF](#) | @[TORRENT](#)